



READING CONTRIBUTORY RETIREMENT SYSTEM

ACTUARIAL VALUATION as of

January 1, 2015

Prepared by:

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March 28, 2016

Reading Contributory Retirement Board
16 Lowell Street
Reading, MA 01867

Dear Board Members:

We are pleased to present the enclosed report summarizing the results of our actuarial valuation of the Reading Contributory Retirement System as of January 1, 2015.

Our valuation was performed in accordance with the provisions contained in Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2015. Disclosures under GASB Statement No. 67, Financial Reporting for Pension Plans (GASB 67) and GASB Statement No. 68, Accounting and Financial Reporting for Pensions (GASB 68) are provided in a separate report.

The principal results of our valuation are summarized in Section 2. The summary of Plan provisions and actuarial methods and assumptions are shown in Sections 5 and 6, respectively. Section 7 summarizes the demographic profile of active members, retired plan members and beneficiaries and disabled plan members. Asset information and actuarial liabilities are presented in Section 2. The development of the required appropriations pursuant to Chapter 32 of the M.G.L. is shown in Section 3. The summary of information for PERAC is presented in Section 4.

We also provide a 30-year forecast of the required appropriations and cash flows in Section 3.

Our actuarial valuation is based on an investment return rate of 7.65%, compounded annually. Our calculations were based on participant census and asset data and other information provided by the Reading Contributory Retirement System and the benefit provisions of Chapter 32 of the M.G.L. as of January 1, 2015.

K M S A C T U A R I E S

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Our valuation follows generally accepted actuarial methods and we perform such tests as we consider necessary to assure the accuracy of the results. The amounts presented in this report have been appropriately determined according to the actuarial assumptions and methods stated herein.

We appreciate this opportunity to be of service to the Reading Contributory Retirement Board. We are available to answer any questions with respect to our valuation.

Respectfully submitted,

A handwritten signature in black ink that reads "Linda Bournival". The signature is written in a cursive, flowing style.

Linda L. Bournival, FSA

Member, American Academy of Actuaries

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ACTUARIAL CERTIFICATION

This report presents the results of the Actuarial Valuation of the Reading Contributory Retirement System as of January 1, 2015. The report presents the funding schedule contribution amounts for the fiscal years beginning 2017.

This valuation is based upon member data and asset information provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Reading Contributory Retirement System. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

Future actuarial valuation results may differ significantly from the current results presented in this report. Examples of potential sources of volatility include plan experience differing from that anticipated by the economic or demographic assumptions, the effect of new entrants, changes in economic or demographic assumptions, the effect of law changes and the delayed effect of smoothing techniques.

This report is intended for the sole use of the Reading Contributory Retirement System and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,



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SECTION 1 - SUMMARY

Background

We have completed the Actuarial Valuation of the Reading Contributory Retirement System as of January 1, 2015. This valuation is based upon census data and asset information provided by the Retirement Board. Information for the prior valuation completed as of July 1, 2013 was obtained from the valuation report prepared by KMS Actuaries.

Massachusetts General Laws

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L.").

The valuation does not take into consideration:

- Changes in the law after the valuation date,
- Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- State-mandated benefits and
- Cost-of-living increases granted to members in pay status between 1982 and 1997.

GASB Statement Numbers 67 and 68

The Governmental Accounting Standards Board (**GASB**) is responsible for establishing accounting standards for governmental entities. Calculations developed in accordance with GASB standards are required when providing financial statements.

In June 2012, the GASB approved two related Statements that significantly change the way pension plans and governments will account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaces the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaces the requirements of Statement No. 27.

The required disclosures under the new GASB Statements are presented in a separate report.

SECTION 1 - SUMMARY

Actuarial Valuation

Previously, the annual actuarial valuations for the Reading Retirement System were performed as of July 1. Beginning in 2015, the valuations will be performed as of January 1 in order to streamline financial reporting. Results for this valuation have been compared to those as of July 1, 2013, which represents an 18-month period.

During the 18 months since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease from \$39,457,704 as of July 1, 2013 to \$34,912,593 as of January 1, 2015, for a total decrease of \$4,545,111. The actual unfunded actuarial accrued liability, before any assumption or plan changes, was \$29,748,300, resulting in an actuarial gain of \$5,164,293. The actuarial gain was primarily made up of an asset gain of \$2,396,428 and a demographic experience gain of \$2,767,865. The details of the gain and loss analysis are provided in Exhibit 2.6.

Appropriations

The funding appropriation for each year is computed as the sum of the normal cost and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made August 1 and December 31 of each fiscal year. The appropriation calculated as of the January 1, 2015 valuation is \$5,012,844, and is made up of a normal cost payment of \$1,317,291 and an amortization payment of \$3,695,553. The amortization method is an increasing amortization of the unfunded actuarial accrued liability at 4.50% over 14 years and is expected to fully pay the unfunded actuarial accrued liability by the year 2029. The development of the appropriation as of January 1, 2015 is presented in Exhibit 3.1.

For fiscal year 2016, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2016 Appropriation" letter dated November 6, 2014 of \$5,184,813. The Board has adopted a new funding schedule developed in this valuation based on certain assumption changes and changes to plan provisions, detailed below. Based on the results of this valuation, the unfunded actuarial accrued liability is expected to be fully paid by 2029. The current funding schedule is shown in Exhibit 3.2.

SECTION 1 - SUMMARY

A summary of principal valuation results from the current valuation and the prior valuation follows. Changes in actuarial assumptions and methods and Plan provisions are discussed below, as well as changes in census data and asset information.

Valuation Date*	<u>1/1/2015</u>	<u>7/1/2013</u>	<u>Increase/ (Decrease)</u>
Summary of Member Data			
Active Members	333	344	(3.2%)
Average Age	48.7	48.4	0.6%
Average Service	15.0	15.2	(1.3%)
Salary	\$22,793,551	\$22,546,502	1.1%
Average Salary	\$68,449	\$65,542	4.4%
Retired Members and Beneficiaries	293	286	2.4%
Average Age	75.0	74.8	0.3%
Total Annual Pension	\$7,747,921	\$7,032,171	10.2%
Average Annual Pension	\$26,443	\$24,588	7.5%
Disabled Members	40	45	(11.1%)
Average Age	68.4	70.1	(2.4%)
Total Annual Pension	\$1,207,244	\$1,203,717	0.3%
Average Annual Pension	\$30,181	\$26,749	12.8%
Inactive Members	36	31	16.1%
Annuity Savings Fund	1,255,953	\$807,939	55.5%
Actuarial Accrued Liability (AAL)	\$159,188,784	\$140,807,141	13.1%
Assets			
Market Value of Assets (MVA)	\$119,019,943	\$100,175,591	18.8%
Actuarial Value of Assets (AVA)	116,227,245	101,349,437	14.7%
Unfunded Accrued Liability	\$42,961,539	\$39,457,704	8.9%
Funded Status on AVA	73.0%	72.0%	1.4%
Funded Status on MVA	74.8%	71.1%	5.2%
Normal Cost			
Employer	\$1,192,291	\$1,292,443	(7.7%)
Employee	2,153,673	1,978,814	8.8%
Administrative Expenses	125,000	87,000	43.7%
Total Normal Cost	\$3,470,964	\$3,358,257	3.4%

* Effective with the January 1, 2015 valuation, the annual valuation date has changed from July 1 to January 1.

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 1 - SUMMARY

Valuation Date	<u>1/1/2015</u>	<u>7/1/2013</u>	<u>Increase/ (Decrease)</u>
Appropriations			
Fiscal Year 2016	\$5,184,813	\$5,184,813	0.0%
Fiscal Year 2017	\$5,418,129	\$5,418,129	0.0%
Fiscal Year 2018	\$5,661,945	\$5,661,945	0.0%

Actuarial Assumptions and Methods

Several Actuarial Assumptions and Methods used in this valuation have changed from those used in the prior valuation. These include a change to the annual actuarial valuation date from July 1 to January 1, an update to the mortality tables from the RP-2000 Mortality Table projected to 2012 to the RP-2014 Mortality Table with full generational mortality improvement using Scale MP-2014, a decrease in the investment return rate from 7.75% to 7.65%, an increase in the administrative expense assumption from \$87,000 per year to \$125,000 per year and a decrease to the annual rates of expected salary increases. Changing these assumptions resulted in a net increase in the unfunded actuarial accrued liability of \$11,684,098 and an increase in the employer normal cost of \$83,673. The Actuarial Assumptions and Methods utilized in this valuation are detailed in Section 6, Actuarial Assumptions and Methods.

Plan Provisions

The COLA base was increased to \$14,000 effective July 1, 2016. The unfunded actuarial accrued liability and the employer normal cost increased by \$1,529,141 and \$83,673, respectively, as a result of this change. The Plan provisions utilized in this valuation are detailed in Section 5, Summary of Plan Provisions.

Census Data

As of January 1, 2015, there are 333 active members who may be eligible for benefits in the future, 293 retirees and beneficiaries, 36 inactives and 40 disabled retirees. Summaries of the active, retired and disabled employees are included in Section 7, Demographic Information.

Assets

This valuation is based upon asset information provided by the Reading Contributory Retirement Board. The market value of assets increased from \$100,175,591 as of July 1, 2013 to \$119,019,943 as of January 1, 2015. During the calendar years ended 2013 and 2014, the rates of return on the market value of assets were 14.61% and 7.56%, respectively.

The actuarial value of assets increased from \$101,349,437 as of July 1, 2013 to \$116,227,245 as of January 1, 2015. During the years ended June 30, 2014 and December 31, 2014, the rates of return on the actuarial value of assets were 9.39% and 9.18%, respectively.

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Reading Contributory Retirement System. The Market Value of Assets for the two most recent calendar years are as follows:

Calendar Year Ended December 31	2014	2013
Trust Fund Composition at Year-End		
Cash	\$250,280	\$200,260
Short-Term Investments	0	0
Fixed Income Securities	0	0
Equities	0	0
Pooled Short Term Funds	0	0
Pooled Domestic Equity Funds	0	0
Pooled International Equity Funds	0	0
Pooled Global Equity Funds	0	0
Pooled Domestic Fixed Income Funds	0	0
Pooled International Fixed Income Funds	0	0
Pooled Global Fixed Income Funds	0	0
Pooled Alternative Investments	0	0
Pooled Real Estate Funds	0	0
Pooled Domestic Balanced Funds	0	0
Pooled International Balanced Funds	0	0
Hedge Funds	0	0
PRIT Cash	1,820,079	1,700,056
PRIT Fund	116,900,024	110,085,635
Interest Due & Accrued	0	0
Prepaid Expenses	138	375
Accounts Receivable	49,446	77,105
Land	0	0
Buildings	0	0
Accumulated Depreciation - Buildings	0	0
Accounts Payable	(24)	(8,857)
Total Market Value of Assets	\$119,019,943	\$112,054,574

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Calendar Year Ended December 31	2014	2013
Funds		
Annuity Savings Fund	\$24,769,856	\$23,683,160
Annuity Reserve Fund	7,761,890	7,517,653
Military Service Fund	26,766	33,056
Pension Fund	15,530,994	17,933,966
Expense Fund	0	0
Pension Reserve Fund	70,930,437	62,886,739
Total Market Value of Assets	<u>\$119,019,943</u>	<u>\$112,054,574</u>
Asset Activity		
Market value as of January 1	\$112,054,574	\$98,952,597
Contributions and Receipts	8,055,825	7,342,157
Benefit Payments and Expenses	(9,506,888)	(8,609,201)
Investment Return	8,416,432	14,369,021
Market Value as of December 31	<u>\$119,019,943</u>	<u>\$112,054,574</u>
Estimated Rate of Return	7.56%	14.61%

PERAC Rates of Return

Returns and annualized past returns developed by PERAC are shown below. Information is obtained from the Annual Investment Reports published by PERAC for the years shown.

Year	1-Year Return	5-Year Return	Return (Since 1985)
2014	8.27%	10.14%	9.50%
2013	15.22%	12.02%	9.54%
2012	14.15%	1.57%	9.34%
2011	0.19%	1.21%	9.17%
2010	13.61%	4.37%	9.53%
2009	17.85%	4.21%	9.37%
2008	-29.42%	3.60%	9.03%
2007	12.17%	16.39%	11.11%
2006	16.84%	11.63%	11.06%
2005	12.75%	7.03%	10.79%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Valuation Date	1/1/2015 *	7/1/2014	7/1/2013
1. Actuarial Value of Assets, prior year	\$109,602,111	\$101,349,437	\$95,702,594
a. Prior Year Contributions and Receipts	6,335,058	7,761,053	7,055,231
b. Prior Year Benefit Payments and Expenses	(4,671,298)	(8,966,661)	(8,476,792)
c. Average Actuarial Value of Assets	110,018,051	100,746,633	94,991,814
d. Expected Investment Return Rate	7.75%	7.75%	7.75%
e. Expected Investment Income	4,263,199	7,807,864	7,361,866
f. Preliminary Actuarial Value of Assets	115,529,070	107,951,693	101,642,899
g. Market Value of Assets as of end of year	119,019,943	116,203,781	100,175,591
h. Adjustment toward Market Value ¹	698,175	1,650,418	(293,462)
i. Actuarial Value of Assets, before corridor	116,227,245	109,602,111	101,349,437
* The development of the actuarial value of assets for the period ending December 31, 2014 is based on asset activity for the period July 1, 2014 through December 31, 2014.			
2. Actuarial Value of Assets			
a. Market Value of Assets Less			
Actuarial Value of Assets, before corridor	\$116,227,245	\$109,602,111	\$101,349,437
b. 80% of Market Value of Assets	95,215,955	92,963,025	80,140,473
c. 120% of Market Value of Assets	142,823,932	139,444,537	120,210,709
d. Actuarial Value of Assets, a., but not less than b. and not greater than c.	\$116,227,245	\$109,602,111	\$101,349,437
e. Ratio of Actuarial Value of Assets to Market Value of Assets	97.65%	94.32%	101.17%
3. Rate of Return on Actuarial Value of Assets for Prior Year*	9.18%	9.39%	

* rate of return on January 1, 2015 actuarial value of assets was computed on 6-month period, then annualized.

SECTION 2 - PRINCIPAL VALUATION RESULTS

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation:

Exhibit 2.2 - Actuarial Present Value of Future Benefits

Valuation Date	<u>1/1/2015</u>	<u>7/1/2013</u>
Actives		
Superannuation	\$83,794,071	\$77,988,050
Termination	1,532,120	1,484,704
Death	3,834,986	3,972,845
Disability	11,839,186	10,273,144
Total Actives	<u>\$101,000,363</u>	<u>\$93,718,743</u>
Retired Members and Inactives		
Retired Members and Beneficiaries	\$77,012,989	\$64,806,405
Disabled Members	12,636,995	10,310,556
Inactive Members	1,255,953	807,939
Total Retired Members and Inactives	<u>\$90,905,937</u>	<u>\$75,924,900</u>
Total Present Value of Future Benefits	\$191,906,300	\$169,643,643

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

Exhibit 2.3 - Actuarial Accrued Liability

Valuation Date	<u>1/1/2015</u>	<u>7/1/2013</u>
Actives		
Superannuation	\$61,939,913	\$58,203,188
Termination	668,890	687,637
Death	1,910,848	1,831,471
Disability	3,763,196	4,159,945
Total Actives	<u>\$68,282,847</u>	<u>\$64,882,241</u>
Retired Members and Inactives		
Retired Members and Beneficiaries	\$77,012,989	\$64,806,405
Disabled Members	12,636,995	10,310,556
Inactive Members	1,255,953	807,939
Total Retired Members and Inactives	<u>\$90,905,937</u>	<u>\$75,924,900</u>
Total Actuarial Accrued Liability	\$159,188,784	\$140,807,141

SECTION 2 - PRINCIPAL VALUATION RESULTS

The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

Exhibit 2.4 - Normal Cost

Valuation Date	<u>1/1/2015</u>	<u>7/1/2013</u>
Actives		
Superannuation	\$2,136,640	\$2,279,565
Termination	290,900	196,318
Death	205,294	222,915
Disability	713,130	572,459
Total Actives	\$3,345,964	\$3,271,257
 Administrative Expenses	 \$125,000	 \$87,000
 Total Normal Cost		
Normal Cost	\$3,470,964	\$3,358,257
As a Percentage of Salary	15.2%	14.9%
 Employee Normal Cost		
Employee Contributions	\$2,153,673	\$1,978,814
As a Percentage of Salary	9.4%	8.8%
 Employer Normal Cost		
Employer Normal Cost	\$1,317,291	\$1,379,443
As a Percentage of Salary	5.8%	6.1%

Exhibit 2.5 - Unfunded Actuarial Accrued Liability

Valuation Date	<u>1/1/2015</u>	<u>7/1/2013</u>
Unfunded Actuarial Accrued Liability		
a. Actuarial Accrued Liability	\$159,188,784	\$140,807,141
b. Actuarial Value of Assets	116,227,245	101,349,437
c. Unfunded Actuarial Accrued Liability (a. - b.)	\$42,961,539	\$39,457,704
d. Funded Ratio (b. divided by a.)	73.0%	72.0%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.6 - Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the 18-month period since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease by \$4,545,111. Below is the development of the Actuarial Gain or Loss for the period July 1, 2013 through December 31, 2014:

Plan Year Ending	12/31/2014 *	6/30/2014
Expected Unfunded Actuarial Accrued Liability		
a. Unfunded Actuarial Accrued Liability, beginning of year	\$38,072,404	\$39,457,704
b. Normal cost, beginning of year	\$1,754,689	3,358,257
c. Total contributions	(6,335,058)	(7,761,053)
d. Interest (full year on a. and b., monthly on c.)*	1,420,558	3,017,496
e. Expected Unfunded Actuarial Accrued Liability	\$34,912,593	\$38,072,404
f. Unfunded Actuarial Accrued Liability (before changes)	\$29,748,300	
g. (Gain)/Loss	(\$5,164,293)	
* The 12/31/2014 plan year begins on July 1, 2014; entries have been adjusted for 6-month period.		
Asset (Gain)/Loss		
a. Actuarial value of assets, beginning of year	\$109,602,111	\$101,349,437
b. Contributions and Receipts	6,335,058	7,761,053
c. Benefit Payments and Expenses	(4,671,298)	(8,966,661)
d. Assumed rate of return	7.75%	7.75%
e. Expected return	4,279,317	7,807,864
f. Actuarial value of assets, end of year	116,227,245	109,602,111
g. Actual return	4,961,374	9,458,282
h. Actual rate of return (annualized)	9.18%	9.39%
i. Asset (gain)/loss	(\$682,057)	(\$1,650,418)
j. Total (gain)/loss over the 18-month period	(\$2,396,428)	
* The 12/31/2014 plan year begins on July 1, 2014; entries have been adjusted for 6-month period.		
Actual Unfunded Actuarial Accrued Liability		
a. Changes due to:		
i) Asset (gain)/loss	(\$2,396,428)	
ii) (Gain)/loss from demographic experience	(2,767,865)	
iii) Total (Gain)/loss prior to changes	(5,164,293)	
iv) Unfunded Actuarial Accrued Liability (before change)	29,748,300	
v) Assumption changes	11,684,098	
vi) Plan changes	1,529,141	
b. Unfunded Actuarial Accrued Liability, end of year	42,961,539	

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.1 - Annual Appropriations

The **Annual Appropriation** is determined in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws ("M.G.L."). The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriation for the current valuation.

Amortization Payment	Outstanding Balance at 1/1/2015	Period (in years)	Payment Increase Rate	Annual Payment
a. Assumption Change	\$11,684,098	14	4.50%	\$1,005,066
b. Plan Change	\$1,529,141	14	4.50%	\$131,537
c. Unfunded Actuarial Accrued Liability	\$29,748,300	14	4.50%	\$2,558,950
d. Total	\$42,961,539			\$3,695,553
Normal Cost				\$1,317,291
Total Appropriation at Valuation Date				\$5,012,844

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibits 3.2 and 3.3, are based on the assumptions below:

- Total Normal Cost is expected to increase 4.50% per year.
- Employee Contributions are expected to increase by 4.50% per year.
- Employer Normal Cost is the difference between Total Normal Cost and Employee Contributions.
- The Unfunded Actuarial Accrued Liability ("UAL") is computed as of January 1 of each year assuming no future gains or losses.
- Total Employer Cost is the sum of the Employer Normal Cost and the Amortization of the UAL, both computed as of January 1 of each year and adjusted for semi-annual payments made on August 1 and December 31.
- For fiscal year 2016, we show the actual appropriation developed under the previous funding schedule of \$5,184,813. The Board has adopted a new funding schedule developed in this valuation, providing annual appropriations that increase by 4.50% per year. Based on the results of this valuation, the unfunded actuarial accrued liability is expected to be fully paid by 2029.
- Expected benefit payments include payments expected to be made to retired members, beneficiaries, disabled members and active members expected to retire. In addition, expected benefit payments include distribution of the annuity savings fund attributed to inactive members.
- Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.50% per year thereafter or the expected future payments for the current population projected by our computer model.

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.2 - 30-Year Forecast of Annual Appropriations

Fiscal Year Ending	Total Normal Cost	Employee Contributions	Employer Normal Cost	Amortization Payment of UAL	Total Employer Cost	Increase over Prior Year	Unfunded Actuarial Accrued Liability
2016	\$3,534,922	\$2,193,358	\$1,341,564	\$3,843,249	\$5,184,813		\$42,961,539
2017	3,693,993	2,292,059	1,401,934	4,016,195	5,418,129	4.50%	42,185,696
2018	3,860,223	2,395,201	1,465,022	4,196,923	5,661,945	4.50%	41,167,693
2019	4,033,933	2,502,985	1,530,948	4,385,785	5,916,733	4.50%	39,880,779
2020	4,215,460	2,615,619	1,599,841	4,583,145	6,182,986	4.50%	38,295,785
2021	4,405,157	2,733,322	1,671,835	4,789,385	6,461,220	4.50%	36,380,925
2022	4,603,388	2,856,321	1,747,067	5,004,908	6,751,975	4.50%	34,101,578
2023	4,810,540	2,984,856	1,825,684	5,230,129	7,055,813	4.50%	31,420,048
2024	5,027,015	3,119,174	1,907,841	5,465,485	7,373,326	4.50%	28,295,317
2025	5,253,231	3,259,537	1,993,694	5,711,430	7,705,124	4.50%	24,682,768
2026	5,489,626	3,406,216	2,083,410	5,968,446	8,051,856	4.50%	20,533,889
2027	5,736,660	3,559,495	2,177,165	6,237,025	8,414,190	4.50%	15,795,950
2028	5,994,810	3,719,672	2,275,138	6,517,690	8,792,828	4.50%	10,411,664
2029	6,264,576	3,887,058	2,377,518	4,398,391	6,775,909	-22.94%	4,318,810
2030	6,546,481	4,061,975	2,484,506	-	2,484,506	-63.33%	-
2031	6,841,073	4,244,765	2,596,308	-	2,596,308	4.50%	-
2032	7,148,921	4,435,779	2,713,142	-	2,713,142	4.50%	-
2033	7,470,623	4,635,388	2,835,235	-	2,835,235	4.50%	-
2034	7,806,801	4,843,980	2,962,821	-	2,962,821	4.50%	-
2035	8,158,107	5,061,959	3,096,148	-	3,096,148	4.50%	-
2036	8,525,222	5,289,748	3,235,474	-	3,235,474	4.50%	-
2037	8,908,857	5,527,787	3,381,070	-	3,381,070	4.50%	-
2038	9,309,756	5,776,537	3,533,219	-	3,533,219	4.50%	-
2039	9,728,695	6,036,482	3,692,213	-	3,692,213	4.50%	-
2040	10,166,486	6,308,124	3,858,362	-	3,858,362	4.50%	-
2041	10,623,978	6,591,990	4,031,988	-	4,031,988	4.50%	-
2042	11,102,057	6,888,629	4,213,428	-	4,213,428	4.50%	-
2043	11,601,649	7,198,618	4,403,031	-	4,403,031	4.50%	-
2044	12,123,723	7,522,556	4,601,167	-	4,601,167	4.50%	-
2045	12,669,290	7,861,071	4,808,219	-	4,808,219	4.50%	-

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.3 - 30-Year Forecast of Cash Flow

Calendar Year	Assets, BOY	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Assets, EOY
2015	\$119,019,943	\$10,598,866	\$2,153,673	\$5,091,003	\$9,253,837	\$124,919,590
2016	124,919,590	9,768,572	2,250,588	5,320,098	9,761,858	132,483,562
2017	132,483,562	10,213,525	2,351,864	5,559,502	10,349,545	140,530,948
2018	140,530,948	10,689,016	2,457,698	5,809,680	10,974,217	149,083,527
2019	149,083,527	11,209,273	2,568,294	6,071,116	11,637,050	158,150,714
2020	158,150,714	11,726,442	2,683,867	6,344,315	12,340,649	167,793,103
2021	167,793,103	12,312,477	2,804,641	6,629,810	13,086,956	178,002,033
2022	178,002,033	12,828,512	2,930,850	6,928,151	13,880,679	188,913,201
2023	188,913,201	13,415,477	3,062,738	7,239,918	14,726,871	200,527,251
2024	200,527,251	13,917,888	3,200,561	7,565,714	15,631,596	213,007,234
2025	213,007,234	14,544,193	3,344,586	7,906,172	16,599,421	226,313,220
2026	226,313,220	15,198,682	3,495,092	8,261,950	17,631,025	240,502,605
2027	240,502,605	15,882,623	3,652,371	8,633,737	18,730,826	255,636,916
2028	255,636,916	16,597,341	3,816,728	6,653,311	19,722,334	269,231,948
2029	269,231,948	17,344,221	3,988,481	2,439,553	20,424,572	278,740,333
2030	278,740,333	18,124,711	4,167,963	2,549,333	21,144,238	288,477,156
2031	288,477,156	18,940,323	4,355,521	2,664,053	21,881,033	298,437,440
2032	298,437,440	19,792,638	4,551,519	2,783,936	22,634,558	308,614,815
2033	308,614,815	20,683,307	4,756,337	2,909,213	23,404,311	319,001,369
2034	319,001,369	21,614,056	4,970,372	3,040,128	24,189,670	329,587,483
2035	329,587,483	22,586,689	5,194,039	3,176,934	24,989,881	340,361,648
2036	340,361,648	23,603,090	5,427,771	3,319,896	25,804,044	351,310,269
2037	351,310,269	24,665,229	5,672,021	3,469,291	26,631,101	362,417,453
2038	362,417,453	25,775,164	5,927,262	3,625,409	27,469,814	373,664,774
2039	373,664,774	26,935,046	6,193,989	3,788,552	28,318,754	385,031,023
2040	385,031,023	28,147,123	6,472,719	3,959,036	29,176,275	396,491,930
2041	396,491,930	29,413,744	6,763,991	4,137,193	30,040,498	408,019,868
2042	408,019,868	30,737,362	7,068,371	4,323,366	30,909,284	419,583,527
2043	419,583,527	32,120,543	7,386,448	4,517,917	31,780,213	431,147,562
2044	431,147,562	33,565,967	7,718,838	4,721,223	32,650,555	442,672,211

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 4 - REQUIRED DISCLOSURES

Exhibit 4.1 - GASB 67 and GASB 68 Disclosures

In June 2012, the GASB approved two related Statements that significantly change the way pension plans and governments will account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaces the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaces the requirements of Statement No. 27.

The new pension standards reflect changes from those currently in place regarding how governments calculate total pension liability and pension expense. Further, the new standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

GASB 67 requires defined benefit pension plans, such as the Reading Contributory Retirement System, to present a statement of fiduciary net position (pension plan assets) and a statement of changes in fiduciary net position. Further, the statement requires that notes to financial statements include descriptive information such as the types of benefits provided, the classes of plan members covered and the composition of the pension plan's retirement board. Finally, GASB 67 requires pension plans to present in required supplementary information the sources of the changes in the net pension liability and information about the actuarially determined contributions compared with the actual contributions made to the plan and related ratios.

GASB 67 and GASB 68 require projected benefit payments be discounted to their actuarial present value using the single rate that reflects:

- (1) a long-term expected rate of return on pension plan investments *to the extent that the pension plan's assets are sufficient to pay benefits and pension plan assets are expected to be invested using a strategy to achieve that return and*
- (2) a tax-exempt, high-quality municipal bond rate *to the extent that the conditions for use of the long-term expected rate of return are not met.*

GASB 68 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, deferred inflows of resources and pension expense by state and local governments.

The effective date for GASB 67 is for plan years beginning after June 15, 2013, which is fiscal year ending December 31, 2014 for the Reading Contributory Retirement System. The effective date for GASB 68 is for employers' fiscal years beginning after June 15, 2014. The GASB report, submitted under separate cover and prepared as of December 31, 2014 (the measurement date), presents information to assist the Reading Contributory Retirement System in providing the required information under GASB 68 to participating employers.

SECTION 4 - REQUIRED DISCLOSURES

Exhibit 4.2 - PERAC Disclosure Information

The most recent actuarial valuation of the System was prepared by KMS Actuaries, LLC as of January 1, 2015.

The normal cost for employees on that date was:	\$2,153,673	9.4% of payroll
The normal cost for the employer was:	\$1,317,291	5.8% of payroll

The actuarial liability for active members was:	\$68,282,847
The actuarial liability for retired and inactive members was:	90,905,937
Total actuarial liability:	\$159,188,784
System assets as of that date:	\$116,227,245
Unfunded actuarial accrued liability:	\$42,961,539

The ratio of System assets to total actuarial accrued liability was:	73.0%
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The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	7.65%
Rate of Salary Increase:	Based on years of service, ranging from 6% decreasing to 4.25% after 9 years of service for Group 1 employees, and ranging from 7% decreasing to 4.75% after 6 years for Group 4 employees.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Administration

There are 105 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

Participation

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are four classes of membership in the Retirement System:

- | | |
|----------|--|
| Group 1: | General employees, including clerical, administrative, technical and all other employees not otherwise classified. |
| Group 2: | Certain specified hazardous duty positions. |
| Group 3: | State police officers and inspectors. |
| Group 4: | Local police officers, firefighters and other specified hazardous positions. |

For members in more than one group, participation will be proportional.

Member Contributions

Member contributions vary depending on the most recent date of membership:

- | | |
|--|---|
| Prior to 1975: | 5% of Salary |
| 1975 – 1983: | 7% of Salary |
| 1984 – June 30, 1996: | 8% of Salary |
| July 1, 1996 – present: | 9% of Salary |
| 1979 – present: | An additional 2% of Salary in excess of \$30,000. |
| Group 1 members hired on or after April 2, 2012: | 6% with 30 or more years of creditable service. |

Rate of Interest

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Retirement Age	The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.
Salary	Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.
Average Salary	<p>Membership before April 2, 2012: Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.</p> <p>Membership on or after April 2, 2012: Average annual rate of regular compensation received during the five consecutive years that produce the highest average, or, if greater, during the last five years (whether or not consecutive) preceding retirement.</p>
Creditable Service	The period during which a member contributes to the retirement system plus certain periods of military service and "purchased" service.
Benefit Rate	The benefit rate varies with the member's retirement age, Group, membership date and years of creditable service at retirement. Each year a member retires prior to the age at which the 2.5% maximum benefit rate applies, a reduction is applied to each year of age under the maximum age.

	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
2.5% for Membership before April 2, 2012:			
Maximum age:	65	60	55
Reduction:	0.1%	0.1%	0.1%
2.5% for Membership on or after April 2, 2012, less than 30 years:			
Maximum age:	67	62	57
Reduction:	0.15%	0.15%	0.15%
2.5% for Membership on or after April 2, 2012, 30 or more years of service:			
Maximum age:	67	62	57
Reduction:	0.125%	0.125%	0.125%

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Superannuation Retirement	Eligibility if membership before April 2, 2012:	<ul style="list-style-type: none"> • completion of 20 years of Creditable Service, or • attainment of age 55 if hired prior to 1978, or • attainment of age 55 with 10 years of Creditable Service, if hired after 1978.
	Eligibility if membership on or after April 2, 2012:	<ul style="list-style-type: none"> • attainment of age 60 with 10 years of Creditable Service if classified in Group 1 • attainment of age 55 with 10 years of Creditable Service if classified in Group 2 • attainment of age 55 if hired prior to 1978, or if classified in Group 4
	Benefit Amount	Product of the member's Benefit Rate, Average Salary and Creditable Service.
	Maximum Benefit	80% of the member's Average Salary.
	Veteran's Benefit	Additional benefit of \$15 per year of Creditable Service, up to a maximum of \$300.
Deferred Vested	Eligibility	<ul style="list-style-type: none"> • completion of ten or more years of Creditable Service. • elected officials hired prior to 1978, completion of six years of Creditable Service.
	Benefit Amount	Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.
Withdrawal of Contributions		<p>Contributions may be withdrawn upon termination of employment.</p> <ul style="list-style-type: none"> • Members hired prior to 1984 receive contributions plus 100% of interest credited. • Members hired after 1983 with less than five years of Creditable Service receive contributions only. • Members hired after 1983 with more than five years of Creditable Service but less than ten years receive contributions plus 50% of interest credited. • Members hired after 1983 with more than ten years of Creditable Service receive contributions plus 100% of interest credited.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Ordinary Disability Retirement	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount for Group 1 membership before April 2, 2012 or Group 2 or Group 4	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest.
	Benefit Amount for Group 1 membership on or after April 2, 2012	Superannuation benefit determined if the member is age 60, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest.
Accidental Disability Retirement	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of Creditable Service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$415 per year for each child.
Non-Occupational Death	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of \$250 per month for surviving spouse, \$120 per month for first child and \$90 per month for each additional child.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Accidental Death	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of creditable service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$708.60 per year for each child until age 18 (or age 22 if a full-time student).
Cost-of-Living Adjustment (COLA)	In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a Cost-of-Living Adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees and beneficiaries who have been receiving benefit payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$14,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the Commonwealth of Massachusetts and are not the liability of the Retirement System.	
Optional Forms of Payment	A member may elect to receive his or her retirement allowance in one of three forms of payment:	
	<ul style="list-style-type: none">• Option A – Total annual allowance commencing at retirement and terminating at member's death.• Option B – A reduced annual allowance commencing at retirement with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.• Option C – A reduced annual allowance commencing at retirement with 66⅔% of benefit continued to designated beneficiary upon death of member. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement.	

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date: January 1, 2015. Prior valuation date, July 1, 2013.

Investment Return: 7.65% per year. Previously, 7.75%.

The investment return assumption is a long-term assumption based on capital market expectations by asset class, historical returns and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach and using the target asset allocation, expected returns by asset class and risk analysis to determine a long-term expected average annual rate of return.

Annuity Savings Fund Interest Rate: 3.00% per year

Amortization Method: *Unfunded Actuarial Accrued Liability (UAL):*
Increasing dollar amount at 4.50% to reduce the Unfunded Actuarial Accrued Liability to zero on or before June 30, 2029.

Salary Scale: The assumed annual rates for salary increases including longevity are illustrated by the following rates that vary by years of service:

<u>Years of Service</u>	<u>General Employees</u>	<u>Police and Fire</u>
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.00%
3	5.25%	5.75%
4	5.25%	5.25%
5	4.75%	5.25%
6	4.75%	4.75%
7	4.50%	4.75%
8	4.50%	4.75%
9 and later	4.25%	4.75%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations and professional judgment.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Cost-of-Living Allowance: Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at \$420 per year.

Post-Retirement Mortality Rates: Post-retirement mortality rates are based on the RP-2014 Mortality Table, projected with fully generational mortality improvement using Scale MP-2014. For Disabled lives, RP-2014 Disabled Mortality Table. Previously, RP-2000 Mortality Table projected to 2012.

Pre-retirement mortality rates are based on the RP-2014 Mortality Table, projected with fully generational mortality improvement using Scale MP-2014. Previously, RP-2000 Mortality Table projected to 2012.

General Employees: 55% of deaths are job-related.

Police and Fire: 90% of deaths are job-related.

The underlying tables with generational mortality improvement reasonably reflect the mortality experience of the System as of the valuation date based on historical and current demographic data. Further, PERAC reviewed a sampling of a few larger local retirement systems and compared the results with the results found in performing the analysis of the State Retirement System for years 2012 - 2014. For the State Retirement System analysis, the mortality assumptions reflect the recent experience study published in 2014.

Turnover Rates: Illustrative turnover rates are shown below:

<u>Years of Service</u>	<u>General Employees</u>	<u>Police and Fire</u>
0	15.0%	1.5%
1	12.0%	1.5%
2	10.0%	1.5%
3	9.0%	1.5%
4	8.0%	1.5%
5-9	7.6%	1.5%
10	5.4%	1.5%
11-14	5.4%	0.0%
15-19	3.3%	0.0%
20-24	2.0%	0.0%
25-29	1.0%	0.0%
30+	0.0%	0.0%

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Disability Rates:

Illustrative disability rates are shown below:

<u>Age</u>	<u>General Employees</u>	<u>Police and Fire</u>
20	0.01%	0.10%
25	0.02%	0.20%
30	0.03%	0.30%
35	0.06%	0.30%
40	0.10%	0.30%
45	0.15%	1.00%
50	0.19%	1.25%
55	0.24%	1.20%
60	0.28%	0.85%

General Employees: 55% of disabilities are accidental and 45% are ordinary.

Police and Fire: 90% of disabilities are accidental and 10% are ordinary.

Retirement Rates:

Illustrative retirement rates are shown below:

<u>Age</u>	<u>General Employees</u>		<u>Police and Fire</u>
	<u>Male</u>	<u>Female</u>	
50	1.0%	1.5%	1.0%
51	1.0%	1.5%	1.0%
52	1.0%	2.0%	1.0%
53	1.0%	2.5%	1.0%
54	2.0%	2.5%	1.0%
55	2.0%	5.5%	2.0%
56	2.5%	6.5%	2.0%
57	2.5%	6.5%	2.0%
58	5.0%	6.5%	5.0%
59	6.5%	6.5%	7.5%
60	12.0%	5.0%	15.0%
61	20.0%	13.0%	10.0%
62	30.0%	15.0%	10.0%
63	25.0%	12.5%	10.0%
64	22.0%	18.0%	15.0%
65	40.0%	15.0%	20.0%
66	25.0%	20.0%	20.0%
67	25.0%	20.0%	25.0%
68	30.0%	25.0%	25.0%
69	30.0%	20.0%	30.0%
70	100.0%	100.0%	100.0%

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

The turnover, disability and retirement rates are based on PERAC's most recent experience analysis of local retirement systems which reviewed age, gender and job group. The assumptions reflect this analysis as well as professional judgment.

Actuarial Cost Method: Individual Entry Age Normal.

Actuarial Asset Method: The Actuarial Value of Assets is determined as follows:

- a) A preliminary Actuarial Value of Assets is developed and equals the Actuarial Value of Assets from the prior year plus contributions and receipts minus benefit payments and expenses plus expected investment earnings.
- b) An adjustment is added to a) that equals 20% of the excess of the Market Value at the end of the year over the preliminary Actuarial Value of Assets developed in a) above.
- c) The Actuarial Value of Assets is further constrained to be not less than 80% or more than 120% of Market Value.

Census Data: Census data as of the valuation date were submitted by the Retirement Board.

Asset Data: Asset information is provided by the Board. Calendar year asset information is reported annually to the Public Employee Retirement Administration Commission by the Reading Contributory Retirement Board.

Dependents: 75% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.

Administrative Expenses: For Fiscal Year 2016, the administrative expenses were assumed to be \$125,000 and are anticipated to increase at 4.5% per year. Previously, \$87,000 per year.

The administrative expense assumption is based on information relating to the System's administrative expenses provided by the Retirement System.

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.1 - Active Members Average Salary by Age and Years of Service

Age	Years of Service									Total
	<u>0 to 4</u>	<u>5 to 9</u>	<u>10 to 14</u>	<u>15 to 19</u>	<u>20 to 24</u>	<u>25 to 29</u>	<u>30 to 34</u>	<u>35 to 39</u>	<u>40 & up</u>	
Under 20	-	-	-	-	-	-	-	-	-	0
	-	-	-	-	-	-	-	-	-	0
20-24	6	-	-	-	-	-	-	-	-	6
	35,558	-	-	-	-	-	-	-	-	35,558
25 to 29	18	3	-	-	-	-	-	-	-	21
	53,745	67,939	-	-	-	-	-	-	-	55,773
30 to 34	7	19	5	1	-	-	-	-	-	32
	54,936	74,626	65,921	63,330	-	-	-	-	-	68,606
35 to 39	5	5	9	4	-	-	-	-	-	23
	59,874	69,728	77,995	80,432	-	-	-	-	-	72,682
40 to 44	4	8	15	9	4	-	-	-	-	40
	77,058	73,871	64,665	77,958	67,890	-	-	-	-	71,059
45 to 49	9	6	6	5	5	9	-	-	-	40
	66,903	42,410	80,511	64,814	84,881	87,348	-	-	-	71,856
50 to 54	5	6	7	9	7	15	5	-	-	54
	45,539	64,990	55,607	91,224	88,310	85,464	89,831	-	-	77,355
55 to 59	6	13	4	6	7	10	10	4	-	60
	63,262	56,656	70,320	58,058	74,745	79,292	80,665	83,663	-	70,053
60 to 64	4	4	6	6	4	7	4	1	4	40
	49,825	40,159	53,299	53,107	52,435	70,688	89,724	87,766	85,079	62,248
65 to 69	1	2	2	2	2	1	2	-	-	12
	45,954	48,302	59,891	64,186	70,532	41,915	52,200	-	-	56,508
70 & up	-	-	1	1	-	3	-	-	-	5
	-	-	44,088	84,224	-	49,552	-	-	-	55,394
Total	65	66	55	43	29	45	21	5	4	333
Average Salary	55,809	63,629	66,160	72,357	75,453	78,809	81,862	84,483	85,079	68,449
Average Age:							48.7	Average Service:		15.0

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.2 - Retired Plan Members and Beneficiaries Annual Pensions

Attained Age	Male		Female		Total	
	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	1	9,270	1	9,270
40-44	0	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	2	41,738	2	43,729	4	85,467
55-59	7	331,320	3	81,139	10	412,459
60-64	22	1,183,687	7	173,120	29	1,356,807
65-69	31	1,350,222	28	642,981	59	1,993,203
70-74	28	1,016,033	18	234,188	46	1,250,221
75-79	29	975,398	22	325,225	51	1,300,623
80-84	16	355,375	29	410,752	45	766,126
85-89	13	220,813	14	121,705	27	342,518
90-94	8	74,637	9	113,637	17	188,274
95+	4	42,951	0	0	4	42,951
Total	160	5,592,175	133	2,155,746	293	7,747,921
Average Age	74.1		76.0		75.0	
Average Payment		34,951		16,209		26,443
	54.6%	72.2%	45.4%	27.8%	100.0%	100.0%

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.3 - Disabled Plan Members Annual Pensions

Attained Age	Male		Female		Total	
	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	1	44,170	1	44,170
45-49	1	45,292	1	49,335	2	94,628
50-54	2	81,679	2	90,601	4	172,279
55-59	2	80,542	0	0	2	80,542
60-64	8	240,812	0	0	8	240,812
65-69	4	107,189	0	0	4	107,189
70-74	6	142,638	0	0	6	142,638
75-79	5	141,625	0	0	5	141,625
80-84	7	155,658	0	0	7	155,658
85-89	1	27,702	0	0	1	27,702
90-94	0	0	0	0	0	0
95+	0	0	0	0	0	0
Total	36	1,023,138	4	184,106	40	1,207,244
Average Age	70.5		50.0		68.4	
Average Payment		28,420		46,027		30,181
	90.0%	84.7%	10.0%	15.3%	100.0%	100.0%

SECTION 8 - GLOSSARY OF TERMS

Actuarial Accrued Liability – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

Actuarial Cost Method (or Funding Method) – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

Actuarial Present Value – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

Amortization Payment – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

Annual Statement – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Reserve Fund – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Annuity Savings Fund – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Assets – The total value of the investments held by the Plan trust that are for the payment of promised benefits.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year.

Expense Fund – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

Funded Ratio – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

SECTION 8 - GLOSSARY OF TERMS

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board.

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

Pension Fund – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

Present Value of Future Benefits – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

Special Fund for Military Service Credit – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

Unfunded Actuarial Accrued Liability – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

SECTION 9 - RESULTS BY DEPARTMENT

Department	Storm Water Enterprise	Housing	Municipal Light	School	Sewer	Water	Retirement	Town	Total
Summary of Member Data as of January 1, 2015									
Active Members	3	4	71	52	4	12	1	186	333
Average Age	46.7	57.4	50.0	53.8	36.2	44.8	43.5	47.2	48.7
Average Service	6.6	12.4	16.2	10.7	11.2	16.3	9.3	16.0	15.0
Salary	142,597	259,326	6,147,851	2,433,145	186,171	659,655	70,371	12,894,435	22,793,551
Average Salary	47,532	64,831	86,589	46,791	46,543	54,971	70,371	69,325	68,449
Retired Members and Survivors	0	3	65	93	2	7	0	123	293
Annual Pensions	0	44,547	2,643,673	1,157,848	41,763	247,645	0	3,612,445	7,747,921
Average Age	0.0	74.8	71.3	77.0	77.9	68.4	0.0	75.7	75.0
Disabled Members	0	0	5	2	1	2	0	30	40
Annual Pensions	0	0	164,186	41,455	28,068	60,081	0	913,454	1,207,244
Average Age	0.0	0.0	59.8	82.1	71.9	57.5	0.0	69.6	68.4
Inactive Members	0	1	6	11	1	0	1	16	36
Annuity Savings Fund	0	62,945	223,589	505,716	33,231	0	18,209	412,263	1,255,953
Normal Cost as of January 1, 2015									
1.1 Total Normal Cost	19,955	44,055	940,654	365,110	16,713	65,320	8,419	1,885,738	3,345,964
1.2 Administrative Expenses	745	1,646	35,141	13,640	624	2,440	315	70,449	125,000
1.3 Total Normal Cost = 1.1 + 1.2	20,700	45,701	975,795	378,750	17,337	67,760	8,734	1,956,187	3,470,964
1.4 Employee Normal Cost	13,886	25,319	583,047	228,680	17,480	58,174	7,141	1,219,948	2,153,673
1.5 Employer Normal Cost = 1.3 - 1.4	6,814	20,382	392,748	150,070	(143)	9,586	1,593	736,239	1,317,291
1.6 Adjusted for payment timing	6,940	20,758	399,985	152,835	(145)	9,763	1,623	749,805	1,341,564
Actuarial Accrued Liability as of January 1, 2015									
2.1 Active Employees	136,527	778,622	19,575,434	4,969,943	477,248	1,983,950	103,046	40,258,077	68,282,847
2.2 Retired Members and Survivors	0	471,510	28,197,972	10,811,888	501,637	2,665,240	0	34,364,742	77,012,989
2.3 Disabled Members	0	0	2,095,744	255,121	265,280	800,858	0	9,219,992	12,636,995
2.4 Inactive Members	0	62,945	223,589	505,716	33,231	0	18,209	412,263	1,255,953
2.5 Total = 2.1 + 2.2 + 2.3 + 2.4	136,527	1,313,077	50,092,739	16,542,668	1,277,396	5,450,048	121,255	84,255,074	159,188,784
Actuarial Value of Plan Assets as of January 1, 2015									
3.1 Actuarial Value of Assets	102,999	1,047,365	37,753,741	11,129,296	816,692	3,818,821	10,582	61,547,749	116,227,245
Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2015									
4.1 UAL = 2.5 - 3.1	33,528	265,712	12,338,998	5,413,372	460,704	1,631,227	110,673	22,707,325	42,961,539
Reading Contributory Retirement System Actuarial Valuation as of January 1, 2015									

SECTION 9 - RESULTS BY DEPARTMENT

Department	Storm Water Enterprise	Housing	Municipal Light	School	Sewer	Water	Retirement	Town	Total
Projected Payroll	142,597	259,326	6,147,851	2,433,145	186,171	659,655	70,371	12,894,435	22,793,551
FY2016 Appropriation									
5.1 Employer Normal Cost	6,940	20,758	399,985	152,835	(145)	9,763	1,623	749,805	1,341,564
5.2 Amortization Payment of UAL*	6,708	16,819	1,064,726	538,935	35,465	108,707	(1,623)	2,073,512	3,843,249
5.3 Total = 5.1 + 5.2	13,648	37,577	1,464,711	691,770	35,320	118,470	0	2,823,317	5,184,813
FY2017 Appropriation									
6.1 Employer Normal Cost	7,252	21,692	417,984	159,713	(152)	10,202	1,696	783,547	1,401,934
6.2 Amortization Payment of UAL**	2,754	25,553	1,157,506	500,448	43,658	156,314	11,529	2,118,433	4,016,195
6.3 Total = 6.1 + 6.2	10,006	47,245	1,575,490	660,161	43,506	166,516	13,225	2,901,980	5,418,129
6.4 Retirement Dept Appropriation***	24	116	3,855	1,615	106	407	(13,225)	7,102	0
6.5 Total = 6.3 + 6.4	10,030	47,361	1,579,345	661,776	43,612	166,923	0	2,909,082	5,418,129
FY2018 Appropriation									
7.1 Employer Normal Cost	7,578	22,668	436,794	166,900	(159)	10,661	1,772	818,808	1,465,022
7.2 Amortization Payment of UAL	2,878	26,703	1,209,594	522,968	45,623	163,348	12,048	2,213,761	4,196,923
7.3 Total = 7.1 + 7.2	10,456	49,371	1,646,388	689,868	45,464	174,009	13,820	3,032,569	5,661,945
7.4 Retirement Dept Appropriation***	26	121	4,028	1,688	111	426	(13,820)	7,420	0
7.5 Total = 7.3 + 7.4	10,482	49,492	1,650,416	691,556	45,575	174,435	0	3,039,989	5,661,945

Notes:

1. Actuarial Value of Plan Assets (3.1) is derived from allocation of assets as shown on separate attachment.

2. FY2017 and FY2018 Appropriation is based on Funding Schedule B-5.

3. 2016 Employer Normal Cost (5.1) is the Employer Normal Cost as of January 1, 2015, adjusted for payment timing (1.6). 2017 Employer Normal Cost (6.1) is based on 2016 Employer Normal Cost (5.1) increased by 4.5%.

*4. Amortization Payment of UAL (5.2) equals fiscal year 2016 budgeted appropriation (5.3) developed in the July 1, 2013 actuarial valuation less Employer Normal Cost (5.1).

**5. Amortization Payment of UAL (6.2) is the total Amortization Payment of UAL (6.2) allocated to each department in the proportion that the UAL (4.1) less 2016 Amortization Payment of UAL (5.2) bears to the total UAL (4.1) less total 2016 Amortization Payment of UAL (5.2).

***6. The appropriation developed for the Retirement department is allocated to each remaining department in the proportion that the department's fiscal year appropriation bears to the total fiscal year appropriation.

Reading Contributory Retirement System
Actuarial Valuation as of January 1, 2015